

## Rockets, Reactions & Ratios

### Interpreting Quantitative Results

#### ***Introduction***

The data collected during your testing and competition with your classmates has limited value if left in the current format of Table 2. “Raw Data from all Groups & Classes.” Often relationships and underlying trends are only exposed when data is calculated or graphed. There is a saying “math is the language of science” which implies that many of the observations that scientist make are often best understood and conveyed through a mathematical expression. Math, science and engineering are closely linked fields with cross-cutting concepts in both theory and application. Mathematicians, scientists and engineers all ask questions, seek patterns and describe relationships by manipulating data.

#### ***Analysis***

1. Consider the raw data collected and recorded in Table 2. List 3 calculations that could be performed using this data. Recall that any data that is not collected directly from an instrument is considered manipulated data.
  
2. Questions and thought patterns guided you through the experimental phase of “Rockets, Reactions & Ratios.” Consider the data *your group* collected during the trials and write questions regarding possible relationships among the variables.
  
3. Now consider all of the data collected during the competition, both this years and previous years. Write questions regarding possible relationships using both raw and manipulated data.

***Assignment***

Choose 4 of the questions you have asked throughout this worksheet and using the “General Graphing Guidelines” create graphs to explore the answer.

- (a) You must use each type of graph (pie, bar, line, scatter with best fit curve)
- (b) The graphs must first be done by hand on graph paper
- (c) Use good graphing techniques
  1. the x is independent variable
  2. the y is dependent variable
  3. use proper increments
  4. label the axis and title each graph (y vs x)
- (d) Recreate the graphs using a computer program. No hand writing over computer images will be accepted. Learn how to use your computer's program!
- (e) Describe the trend depicted by the data. Remember there is also value to the lack of a trend being evident.